

CALIFORNIA DIVISION OF MINES AND GEOLOGY

FAULT EVALUATION REPORT FER-111

SUPPLEMENT NO. 1

October 6, 1981

1. Name of fault.

Maacama fault (Ukiah and Willits segments).

2. Location of fault.

Mendocino County; Ukiah, Elledge Peak, and Willits NE 7.5-minute quadrangles.

3. Reason for supplemental evaluation.

We have received a more complete map from Upp (1981) and additional air photos of the study area (USDA, 1952; 1963). Also, two site specific reports have been submitted, and additional field observations made.

4. List of additional references consulted.

Charles, Leonard, & Associates, 1980, Creek View Estates, focused environmental impact report: Unpublished report prepared for the City of Willits (C-485).

Jones, J.R., 1979, Soils, geologic, and seismic hazards investigation of West Valley Plaza, City of Willits, California: Unpublished consulting report filed with the City of Willits (C-474).

Pampeyan, E.H., Harsh, P.W., and Coakley, J.W., 1981, Preliminary map showing recently active breaks along the Maacama fault zone between Laytonville and Hopland, Mendocino County, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1217 (essentially the same as Open-File Report 80-662), 31 p.

U.S. Department of Agriculture, 1952, Black and white aerial photographs, scale 1:20,000, Flight CVN, roll 9K, #123 to 134; 10K, #24 to 30; 11K, #50 to 55.

_____, 1963, Black and white aerial photographs, scale 1:20,000, Flight CVN, roll 1DD, #53 to 72, 105 to 122; 3DD, #8 to 17, 20 to 29; 4DD, #57 to 78; 7DD, #7 to 15, 122 to 133 (citation includes some photos referenced in original FER).

Upp, R.R., 1981, Map of the Maacama fault zone (preliminary) with Appendix A, in Holocene activity on the Maacama fault: Stanford University, Ph.D. thesis, work in progress (map filed with CDMG, San Francisco District Office).

4. Summary of additional available information.

Subsequent to the completion of FER-111, the City of Willits informed this investigator of two site specific reports in its files. The first, by Jones (1979), documented the existence of an active fault in downtown Willits. Jones confirms some of the fault creep evidence summarized in FER-111, and reports the active trace was verified by trenching just north of West Valley Street (see Fig. 1).

Charles and Associates (1980, p. 29-31) report that several trenches were excavated on the Creek View Estates property north of Willits. Eugene Boudreau reportedly was unable to document the existence of an active fault on the site. Two trenches (#1 and 2, each 12 ft. long) were excavated across a "groove in the ground" next to the eastern boundary of the site. Boudreau did not identify a fault, and concludes that the groove may be an old road, since obliterated by downslope creep. Trench 3 reportedly was entirely in weathered sandstone; no offset soils, fault gouge, or slickensides were noted. In the remaining trenches excavated, randomly oriented slickensides were noted, but no offset soils were detected. The Charles and Assoc. map showing the location of the trenches is planimetric. Also, it clearly shows that one fault mapped by Boudreau (which is approximately on trend with the creeping trace located south of the site) was not ^dtrenched. No trench logs are contained in the report. Finally, the report notes that active faults may exist on the site in areas not investigated.



A report by Pampeyan, et al. (1981) was released, superseding the Pampeyan, et al. (1980) open-file report. The 1981 version is essentially unchanged from the 1980 version except for format.

Upp submitted a more complete version of his 1980 field maps (Upp, 1981). Some additional faults are shown on the later maps, but almost all such faults are in his category of 20 to 50% certainty (of Holocene movement). Upp reports that a trench was excavated across one fault near Twin Lakes, exposing faulted older alluvium overlain by 10 cm of unfaulted colluvium (Fig. 1). Additional observations contained in Appendix A of Upp (1981) appear to support the conclusions of the original FER.

5. Air photo interpretation.

USDA (1952; 1963) aerial photographs were interpreted in order to determine whether any of the additional faults shown by Upp (1981) warranted zoning. In addition, the newly received aerial photos covering additional areas within the three quadrangles studied were reviewed. No additional features suggestive of Holocene strike-slip faulting were noted in the study areas. All reported fault features located outside the recommended SSZ appear to have resulted from other than Holocene fault movement.

6. Field observations.

One additional fault creep locality has been found along River Road (Elledge Peak quadrangle, Fig. 2). This is a narrow zone of left-stepping, en echelon cracks in pavement on trend with the fault features previously delineated.

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Figure 32. Location of
fault creep locality.



In the Ukiah quadrangle, a fault zone is exposed in the banks of the Russian River just north of its junction with the East Fork (Fig. 3). This zone of faulting is at least 20 feet wide and trends north-northwest. The western limit of this fault zone was obscured by slopewash and vegetation. The faulted deposits exposed in the streambank and in much of the channel bottom are probably the Ukiah beds (Plio-Pleistocene), a well bedded unit mostly consisting of sandstones, sandy conglomerates, and mudstones. The main fault exposed strikes N 2° W, dips 62° E, and has horizontal slickensides. Correlation across this fault plane was not possible in this single exposure. The relationship of the fault to overlying soils and alluvium was obscured. Northeast-trending secondary faults also were noted east of the apparent main fault. All of these secondary faults had apparent vertical displacements of about 6 inches to 4 feet. Most of the secondary faults do not appear to have offset the younger stream gravels that overlie the Ukiah (?) beds.

7. Conclusions.

It still appears that the Maacama fault is sufficiently active (Holocene) and well defined. It also appears that none of the faults located outside the recommended Special Studies Zones (delineated on the Preliminary SSZ maps) warrant zoning.

The trenches reported by Charles and Associates (1980) do not preclude the existence of an active fault at the Creek View Estates site, as the trenches are both short and discontinuous. Based on the map included in the Charles and Associates report, this investigator cannot be certain that any of the faults shown on the preliminary SSZ map of the Willits NE quadrangle as crossing the

site have been appropriately evaluated.

It appears that none of the additional faults shown by Upp (1981) are sufficiently active and well defined to warrant zoning, and that no modifications of the SSZ maps are necessary. The Jones (1979) report rather clearly documents the existence of an active fault in downtown Willits.

8. Recommendations.

Based on the information summarized herein, it appears the following modifications of the SSZ maps are appropriate:

1. Add the fault creep locality on River Road (Elledge Peak quad);
2. Add the fault exposed in the banks of the Russian River (Ukiah quad).
3. Use Upp (1981) since it contains more complete information than Upp (1980).

No other modifications appear warranted at this time.

9. Investigating geologist; date.

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 October 6, 1981

TCS/map

I agree with recommendations #1 and 3; disagree with #2. Fault exposed in creek is not known to be the main trace ~~and~~ or even active. Also, its connection with active faults to the NW; SE are unknown.

*GMA
 10/30/81
 PS*



FER III
 Figure 4C. Air photo interpretation along the
 Maacama fault zone.

- DD = deflected drainage
- t = tonal
- LT = linear trough
- B = bench
- N = notch
- ||||| = scarp
- CD = closed depression
- SHT = side-hill/trench
- LD = linear drainage
- BTD = be-toed drainage
- SR = shutter ridge